```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

plt.style.use('default')
```

```
df = sns.load_dataset("tips")
df.head()
```

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 244 entries, 0 to 243
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype   
---  ------      --------------  -----   
 0   total_bill  244 non-null    float64 
 1   tip         244 non-null    float64 
 2   sex         244 non-null    category
 3   smoker      244 non-null    category
 4   day         244 non-null    category
 5   time        244 non-null    category
 6   size        244 non-null    int64   
dtypes: category(4), float64(2), int64(1)
memory usage: 7.4 KB
```

```
df.describe()
```

	total_bill	tip	size
count	244.000000	244.000000	244.000000
mean	19.785943	2.998279	2.569672
std	8.902412	1.383638	0.951100
min	3.070000	1.000000	1.000000
25%	13.347500	2.000000	2.000000
50%	17.795000	2.900000	2.000000
75%	24.127500	3.562500	3.000000
max	50.810000	10.000000	6.000000

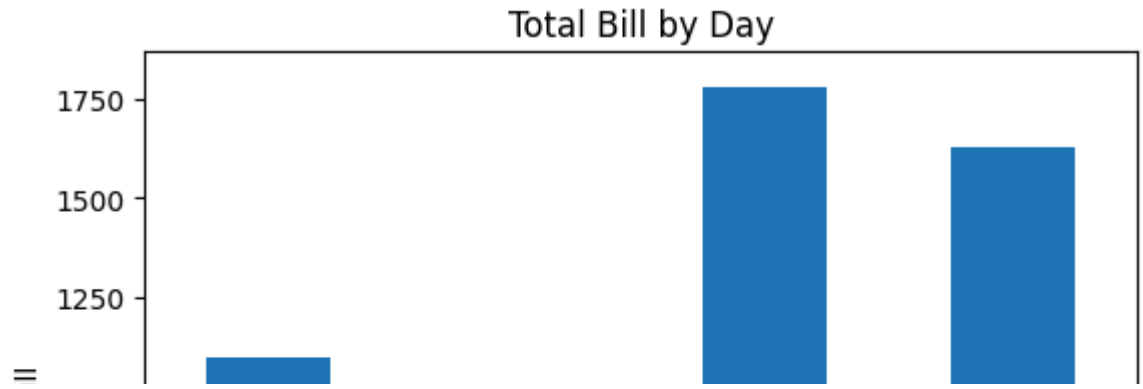
```
df.isnull().sum()
```

	0
total_bill	0
tip	0
sex	0
smoker	0
day	0
time	0
size	0

dtype: int64

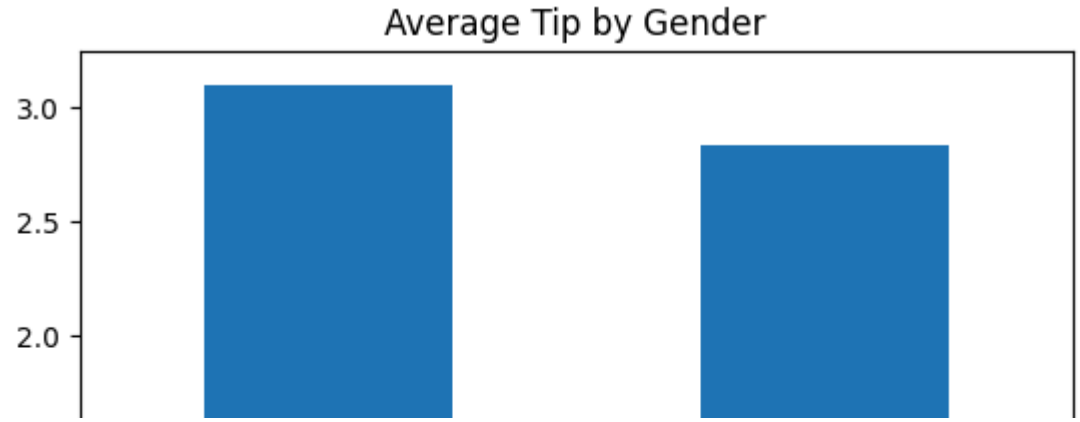
```
df.groupby("day")["total_bill"].sum().plot(kind="bar")
plt.title("Total Bill by Day")
plt.xlabel("Day")
plt.ylabel("Total Bill")
plt.show()
```

```
/tmp/ipython-input-2898254492.py:1: FutureWarning: The default of obser
  df.groupby("day")["total_bill"].sum().plot(kind="bar")
```

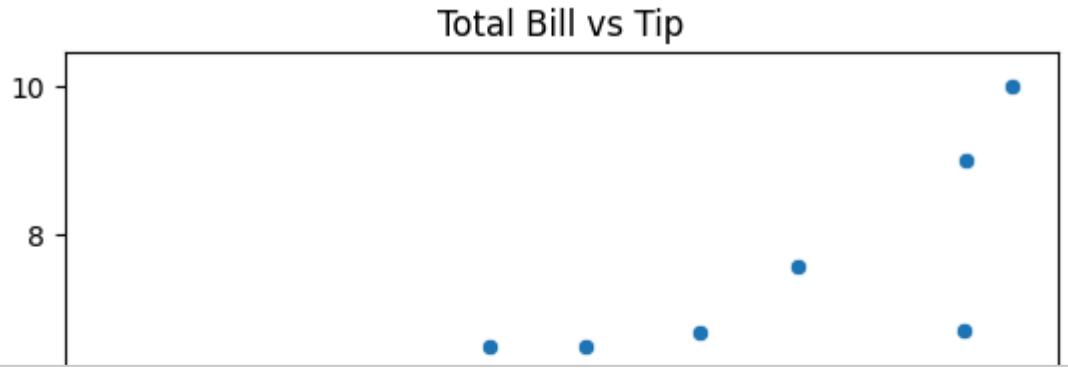



```
df.groupby("sex")["tip"].mean().plot(kind="bar")
plt.title("Average Tip by Gender")
plt.show()
```

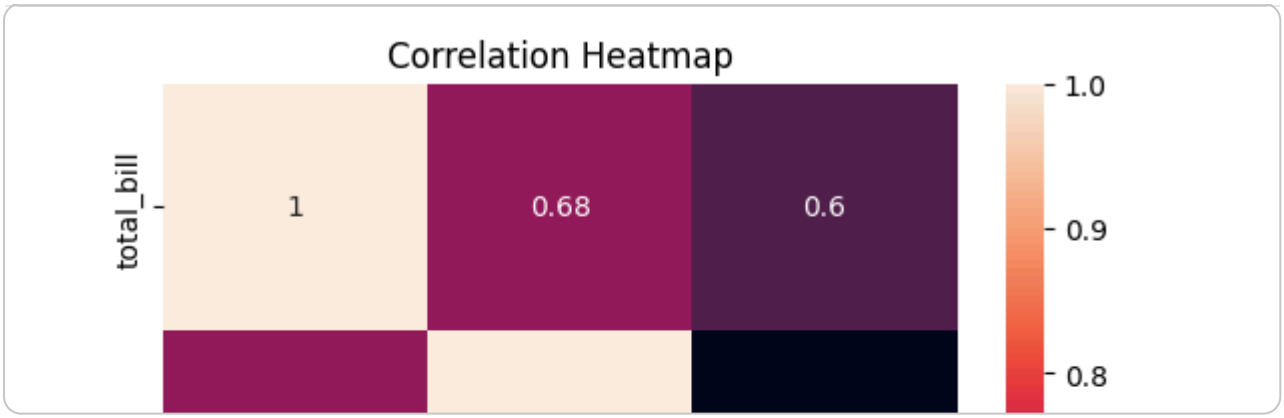
```
/tmp/ipython-input-1150472792.py:1: FutureWarning: The default of obser
  df.groupby("sex")["tip"].mean().plot(kind="bar")
```




```
sns.scatterplot(x="total_bill", y="tip", data=df)
plt.title("Total Bill vs Tip")
plt.show()
```




```
sns.heatmap(df.corr(numeric_only=True), annot=True)
plt.title("Correlation Heatmap")
plt.show()
```



INSIGHTS:

1. Total bills are higher on weekends.
2. Higher total bills usually lead to higher tips.
3. Male and female customers show different tipping patterns.
4. Dataset contains no missing values.
5. Correlation heatmap shows a positive relation between bill and tip